

TWO NEW WOOD-DESTROYING FUNGI

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The opportunities afforded by the regular six months' field season, pursuant to the investigations in forest pathology in the great forest areas of the Northwest, have enabled the writer to collect the fungi of these regions with considerable completeness. In checking up the characters, affinities, and host relationships of a large number of species of wood-rotting fungi collected during the season of 1913 throughout Washington, Idaho, Oregon, and British Columbia, some new and highly interesting fungi, not heretofore reported, have come to light. Brief descriptions of the distinguishing features of two of these species follow.

Fomes putearius, n. sp.—Sporophores hard, woody, very irregularly lobed, recurving, slightly conchate to applanate, occasionally broadly spreading to typically resupinate. The resupinate sporophores are often a foot or more in length. Pileate forms 12 to 14 by 6 to 8 by 0.4 cm. The surface in young specimens is velvety or tomentose, later becoming slightly encrusted, but always more or less corky, zonate, much wrinkled and furrowed in old age, in color deep brown, becoming darker; margin lighter colored, undulate, tomentose, thin, with narrow sterile border when young, later becoming thickened, rounded, and recurved by the successive annual layers; context corky to woody, thick deep brown; tubes irregularly but distinctly stratified 2 to 3 mm. long each season, but much longer in resupinate forms, brown; mouths uniformly oval, varying in size, 4 to 8 to a millimeters, edges thick, ferruginous; spores colored, globose, smooth, 7 to 8 μ ; spines dark brown, slightly ventricose 13 to 25 by 6 μ .

This fungus (Pl. IX, fig. 1), in addition to certain well-defined characters of the sporophore, is chiefly distinguished from its nearest relatives by its most remarkable rot and its host relationships. The fungus is closely related to *Fomes conchatus* (Pers.), which is always found on the wood of deciduous trees, especially on oaks (*Quercus* spp.) and willows (*Salix* spp.). Although many fungi show no discrimination between frondose and coniferous wood, *F. conchatus*, so far as the writer is aware, has not been reported on the wood of conifers, nor has it been collected in the West. Several collections at hand from southern Germany are all on the wood of broad-leaved trees. *Fomes putearius*, on the other hand, always occurs on coniferous wood, with a preference for larch (*Larix* spp.). The rot produced is one of the most conspicuous found in the northwestern forests and has determined the name of the fungus. The decomposition of the wood is quite similar to that produced by *Trametes pini* Fries, but the lignin reduction is on a much greater scale. The cellulose pockets produced by *F. putearius* are frequently more than 2 inches in length and vary in breadth according to the structure of the host. A common type of the rot in larch is shown in Plate IX, figure 2. In yellow pine (*Pinus ponderosa*) the pockets are smaller and more oval (Pl. IX, fig. 3); in Douglas fir (*Pseudotsuga taxifolia*) they are broadly oval (Pl. IX, fig. 4), while in Engelmann spruce (*Picea engelmannii*) they are smaller than in any of the other hosts. This is

clearly shown in Plate IX, figure 5, where the successive stages of the rot in this host are illustrated. The illustrations show the cellulose pockets in their natural size. As in case of other wood-destroying fungi, the rot varies to a limited extent, according to the anatomy and chemical contents of the wood of the host.

The rot produced by *Fomes conchatus* is entirely different. Conspicuous cellulose pockets are never formed, but the decay is frequently characterized by the appearance in close union of two distinct phases of the decomposition, depending, as it seems, on the physical and chemical nature of certain parts of the wood structure. A yellowish white rot first appears which may remain more or less permanently alongside other areas, continuing in the decomposition, later breaking up in irregular areas when dried.

The hard, black encrusting surface sometimes assumed by *Fomes conchatus* is never present in *F. putearius*. Neither does the context become as hard and woody. The spines, although present in considerable number in *F. putearius*, are not a conspicuous character. Those of *Fomes conchatus* are much more abundant and larger.

Type locality.—Priest River, Idaho; Kaniksu National Forest.

Habitat.—Dead coniferous wood.

Range.—Throughout the Northwest, most abundant in the white-pine zone.

Specimens have been examined from practically all the main forest regions.

Trametes setosus, n. sp.—Sporophores pileate or entirely resupinate, depending upon its position on the substratum. The resupinate forms have sharply defined sterile margins and are usually found on the underside of logs, where they may extend for a distance of a foot or more. The distinctly sessile pileate forms are usually free from each other, but may be connected by the resupinate portion, occasionally narrowed at the point of attachment, mostly thickened at the base, rarely applanate or conchate, averaging 1 by 2 by 2 cm. Surface minutely tomentose, becoming smooth or weathered in old specimens, zonate, rich dark brown, uneven; margin thick, of lighter color, entire, becoming slightly serrate in old age, slightly sterile; context ferruginous or fulvous, spongy to corky, slightly zonate, particularly in old specimens; tubes long, often filled with a grayish mycelium, 1 to 1.5 mm.; mouths small, mostly angular, occasionally labyrinth-like, 3 to 6 to a millimeters, edges thick, tomentose; spores hyaline, 4 to 5 by 3 μ . The character that distinguishes the species from all of its near relatives is the immense number of long dense brown setae lining the interior of the tubes. In no other species known to the writer is this character so distinctly pronounced. The longest spines measure 41.45 μ , the shortest about 22.16 μ , with an average of 30.46 μ . The nature and immense number of these setae may be determined by a study of Plate X, figure 11.

The fungus shown in Plate X, figures 6 to 11, was first collected in the Kaniksu National Forest near Priest River, Idaho, on fallen *Pinus monticola*. This tree is the principal host, although the fungus occurs occasionally on the wood of other trees but always on conifers. *Polyporus gilvus* Fr., which seems to be the nearest relative and is usually found on the wood of deciduous trees, has not, so far as the writer is aware, been collected in the West.

Trametes setosus, on account of its abundance, causes serious damage to fallen merchantable timber in forest-fire areas. The chemical action of the mycelium on the wood is to reduce the lignin principally in the spring wood, leaving a cellulose ring alternating with sound autumn wood (Pl. X, fig. 10), which causes the annual rings to separate.

Type locality.—Priest River, Idaho; Kaniksu National Forest.

Habitat.—Dead coniferous wood.

Range.—Throughout the white-pine (*Pinus monticola*) belt of the Northwest. Specimens were collected in all the principal forest areas from Vancouver, B. C., to Montana.

Type specimens of both species have been deposited in the Office of Investigations in Forest Pathology and in the Pathological Collections of the Bureau of Plant Industry, Washington, D. C.

PLATE IX

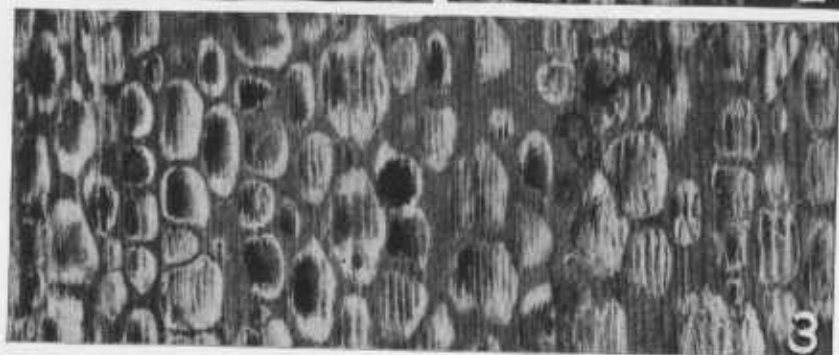
Fig. 1.—*Fomes putearius* from the wood of *Larix occidentalis*, showing a typical pileate fruiting structure; also a section through the resupinate form.

Fig. 2.—*Larix occidentalis*, showing decay of the wood by *Fomes putearius*.

Fig. 3.—*Pinus ponderosa*, showing disintegration of the wood by *Fomes putearius*.

Fig. 4.—*Pseudotsuga taxifolia*, showing the typical decay caused by *Fomes putearius*.

Fig. 5.—*Picea engelmanni*, showing the different stages of the decay caused by *Fomes putearius*.



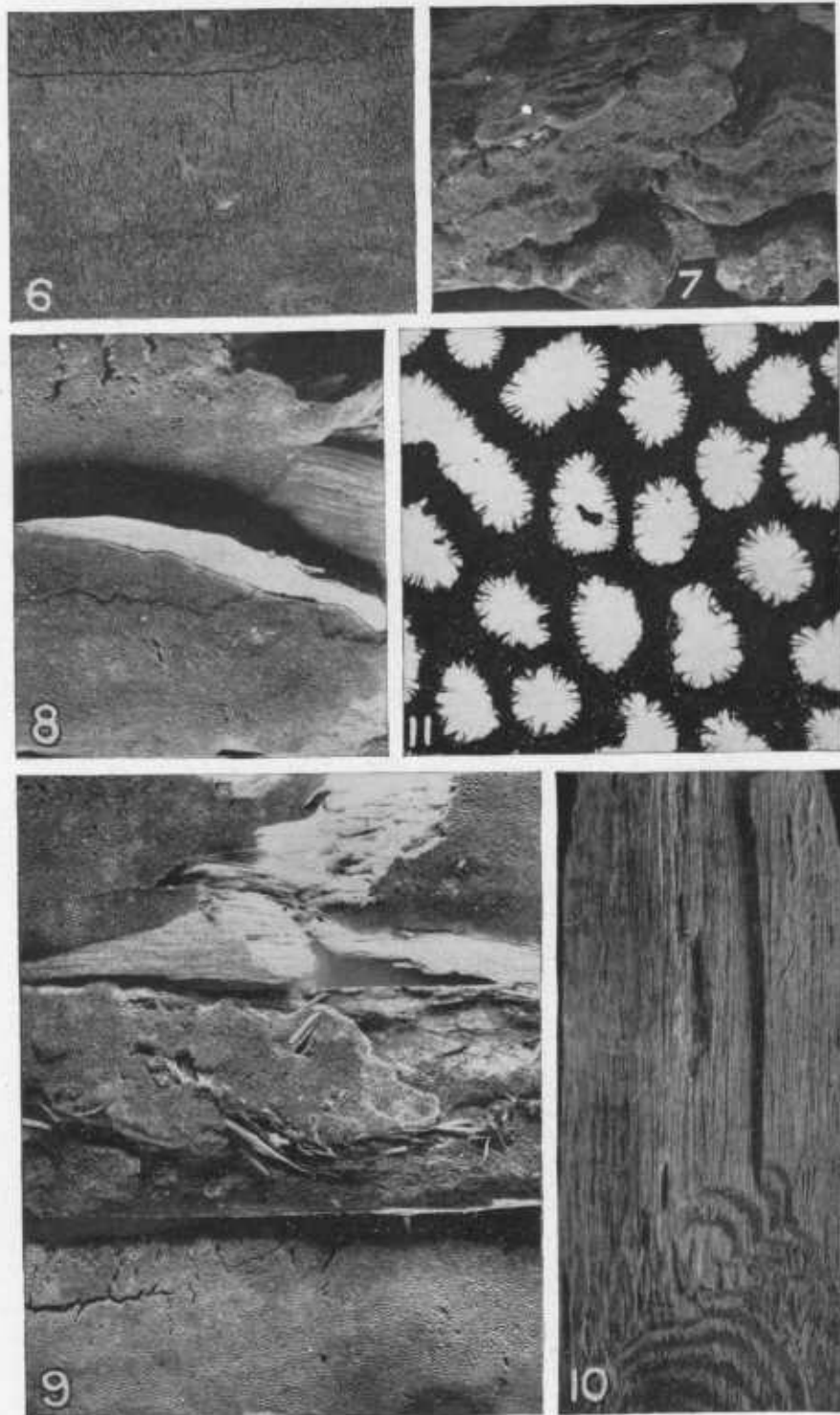


PLATE X

- Fig. 6.—*Trametes setosus* on *Pinus monticola*; resupinate form.
Fig. 7.—*Trametes setosus* on *Pinus monticola*; sessile pileate form.
Fig. 8.—*Trametes setosus*; common form on *Thuja plicata*; pores very slightly enlarged.
Fig. 9.—*Trametes setosus* on *Larix occidentalis*.
Fig. 10.—*Thuja plicata*, showing decay of the wood caused by *Trametes setosus*.
Fig. 11.—*Trametes setosus*: Transverse section of the pores showing the numerous setæ, $\times 60$.